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Fruits significantly more dangerous for teeth than carbonated drinks

LONDON, UK: Eating fruit such as apples could do up to four times the damage to teeth than carbonated drinks, new research has found. In a study led by Prof David Bartlett at the Dental Institute, King's College London, scientists looked at links between diet and tooth wear at several sites in the mouth, in more than 1,000 men and women aged 18 to 30.

The researchers looked for damage to the 2 mm surface enamel of volunteers' teeth and at the dentine, the main supporting structure of the tooth beneath the enamel, and compared what they saw with the results of a questionnaire on the participants' diet.

The findings showed that people who ate apples were 3.7 times more likely to have dentine damage, while those who consumed carbonated drinks had no additional risk. Drinks most often associated with dietary erosion, particularly cola, showed no increased risk in this study.

Fruit juice increased the likelihood of damage to the enamel around the top of the teeth near the gums fourfold, and lager, which is acidic, raised the chances of dentine damage by up to three times.

Bartlett, Head of Prosthodontics at the Dental Institute, said: "Apples are probably worse for erosion than fizzy drinks since they are strongly acidic. However, it would really depend on how you consumed them. What is important is the frequency of consumption—if you took all day to eat the apple then it's likely to cause erosion, but if eaten within a few moments then it is unlikely. Some people drink fizzy drinks quickly too and these will not cause damage, but if sipped over long periods then they are more damaging."

According to Bartlett, the results emphasise that dietary advice should be targeted at strong acids rather than some of the commonly consumed soft drinks. The researchers say that they do not want these findings to deter people from consuming fruit and fruit juices because they are important for overall health and well-being.

"The underlying message is that acids in your diet can damage teeth if consumed throughout the day. These acids can dissolve the teeth if the mouth is not given sufficient time to counteract the effect. Snacking on acidic foods throughout the day is the most damaging, whilst eating them at meal times is much safer," Bartlett said.

"The results of this study confirm previous clinical observations and add to our understanding of tooth wear and provide further evidence that drinking behaviour and the consumption of foods with strong acidity are important factors in tooth erosion," he concluded. DT

EU opens antitrust probe into Novartis, J&J

BRUSSELS — The European Union is investigating whether drug companies Novartis and Johnson & Johnson colluded to keep a generic painkiller out of the Dutch market, the bloc's antitrust watchdog said Friday.

The European Commission is assessing whether contractual arrangements between the two companies "may have had the object or effect of hindering the entry on to the market of generic versions of Fentanyl."

Fentanyl is a strong painkiller for chronic pain.

Novartis spokesman Eric Althoff confirmed the probe, but added "we don't comment on ongoing procedures." The Basel-based company reports its third-quarter results Tuesday.

The Commission said the investigation was triggered by its own inquiry into the ability of generics — cheaper versions of medications that are no longer protected by patents — to enter the market

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127 Nominations Received for "Abu Dhabi Medical Distinction Award"

Abu Dhabi : The Abu Dhabi Medical Distinction Award organising committee announced today that it has received 127 nominations from various public and private health facilities and educational institutes in the Emirate of Abu Dhabi for the Abu Dhabi Medical Distinction Award

Launched in July 2011 by the Health Authority – Abu Dhabi (HAAD), the award aims to acknowledge professionals who have contributed to the improvement and enhancement of the healthcare system, encourage medical and scientific research, honor voluntary work and promote philanthropy.

According to the organizing committee 101 applications met the standard criteria and were presented to the Awards Steering Committee for further evaluation.

Dr. Mohammed Bader Al Seiari, Award Executive Director and Director of Health System Compliance at HAAD said: "We are very pleased with the amount of nominations received in the first edition of Abu Dhabi Medical Distinction Award. Health care facilities and educational institutes have shown a high level of professionalism and quality in their submissions and we expect a fierce competition."

According to the Award Organizing Committee 21 applications were submitted for Health Administration and Management Distinction Award category, 13 applications for Medical Research Distinction Award category, 13 applications for Medical Teaching Distinction Award category, 13 applications for Clinical Performance Distinction Award category, 13 applications for Allied Health Distinction Award Category, 10 applications for Surgical Performance Distinction Award category, 9 applications for Clinical Diagnostics and laboratory Distinction Award category and another 9 applications for Medial Volunteer Distinction Award category. DT

1,800 heart attack cases reported in Dubai yearly

Emirates Cardiac Society (ECS) has said facilities operated by the Dubai Health Authority (DHA) receive on an average 15,000 outpatients every year suffering from some form of cardio-vascular disease (CVD), Khaleej Times has reported.

"In terms of inpatients, the DHA receives 3,000 patients, of which 60% are heart attack cases. The other 40% are cases of heart failure, valvular heart disease and so on," said Dr Fahad Omar Baslaib, president of ECS and head of cardiology department at Rashid Hospital. One in four deaths in the UAE is attributed to cardio vascular disease

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Motor created from single molecule

Scientists have created the world's smallest electric motor, made from a single molecule.

The tiny gadget is expected to lead to new devices that can be used in medicine and engineering.

The microscopic motor is just one nanometre across, about 60,000 times smaller than the width of a human hair.

Team leader Dr Charles Sykes, from Tufts University in Boston, US, said: "There has been significant progress in the construction of molecular motors powered by light and by chemical reactions, but this is the first time that electrically-driven molecular motors have been demonstrated, despite a few theoretical proposals.

"We have been able to show that you can provide electricity to a single molecule and get it to do something that is not just random."

The scientists, who describe their achievement in the journal Nature Nanotechnology, used a state-of-the-art low temperature scanning tunnelling microscope, which uses electrons instead of light to "see" molecules.

The microscope's metal tip provided an electrical charge to a butyl methyl sulphide molecule placed on a conductive copper surface.

This caused compass needle-like "arms" of carbon and hydrogen atoms to rotate around a central axis.

Direction and speed were affected by temperature. The scientists found that a freezing minus 268C proved ideal for tracking the motor's motion. The motor span much faster at higher temperatures, making it difficult to observe and control.

Dr Sykes added: "Once we have a better grasp on the temperatures necessary to make these motors function, there could be real-world application in some sensing and medical devices which involve tiny pipes. Friction of the fluid against the pipe walls increases at these small scales, and covering the wall with motors could help drive fluids along." DT

Incompetent dentists exposed by undercover study

In a study of 20 practices – ten NHS and ten private – a total of 11 visits were rated 'poor' or 'very poor' overall.

Five visits lasted less than ten minutes, with two dentists spending just five minutes with their new patients.

And on five visits, X-rays were not offered, which should be standard practice for a new patient, unless there are health or other reasons that preclude it, a spokesman for Which? said.

Checks on the soft tissue in the mouth, important to screen for oral cancers, were reported on only five of the visits.

Just three of the 20 dentists were rated 'good' and none 'excellent'. The average length of the NHS visits was 11 minutes, a timescale that experts said was 'near impossible' for an adequate initial visit.

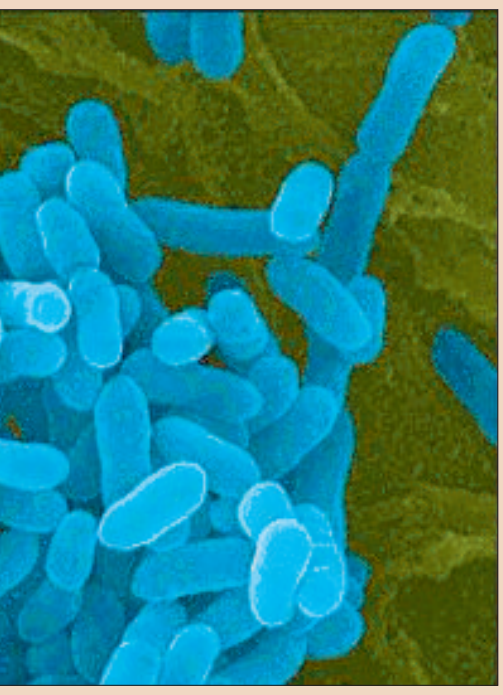
Which? is sharing its audio-taped findings with the dental industry's two regulators – the General Dental Council and the Care Quality Commission.

'In an industry that has not one but two regulators, this level of incompetence is unacceptable. Patients could be left with permanent problems that could have been easily avoided,' said Which? executive director Richard Lloyd.

AD

Certain oral bacteria could signal pancreatic cancer

LONDON, UK/LOS ANGELES, US: Particular types of oral bacteria, some of which are found in gum disease, are associated with the development of pancreatic cancer, a study published in the British journal Gut has reported. According to the US-American researchers who conducted the study, the finding might make it possible to halt the progress of one of the most difficult cancers to treat by altering the balance of bacteria. Pancreatic cancer usually spreads very quickly, and only around one in 20 patients is still alive five years after the diagnosis.



The researchers suggest that levels of certain bacteria could be used as a non-invasive and accurate screening test for pancreatic cancer, with the promise of earlier detection for a disease that has no clear symptoms in its early stages.

The study findings are based on an initial comparison of the bacteria found in the saliva of ten patients with pancreatic cancer that had not yet spread and ten healthy people, matched for age and sex. They found significant differences between the bacterial colonies in the two groups, with 31 additional species and 25 fewer species found in the saliva of the cancer patients compared with the control patients.

The researchers checked saliva samples from a further 28 pancreatic cancer patients and 28 healthy people to verify their findings. Furthermore, they examined saliva samples from 28 patients with chronic inflammation of the pancreas (chronic pancreatitis), which is associated with an increased risk of developing pancreatic cancer.

Amongst six suspicious species, two (Neisseria elongata and Streptococcus mitis) appeared significantly less often in the mouths of the cancer patients than in those of their healthy peers, and levels of Granulicatella adiacens (another species) were significantly higher.

The combination of N. elongata and S. mitis accurately differentiated between healthy patients and those with cancer in more than 80 per cent of cases. Furthermore, the research team found similar differences in the prevalence of S. mitis and G. adiacens between the chronic pancreatitis samples and the saliva of healthy people. It is not yet clear whether the presence of particular types of bacteria is a cause or effect of pancreatic cancer, the authors say. However, their findings corroborate previous research that has indicated that oral bacteria play a role in the development of pancreatic diseases. DT

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S-Max pico Series features ultra-mini head and super-slim body that has been developed specifically for delicate operations with high precision. With its greater visibility and accessibility to hard-to-treat oral areas, pico allows you to work more freely on pedodontics treatment, chamber opening, mirror-technique operation, and buccal and lingual axial reduction in the posterior areas. Pico is now a "must-have" handpiece for every practice and clinic which will be beneficial to both patients and clinicians. Use of NSK's original pico bur (or its equivalent bur) is strictly required.

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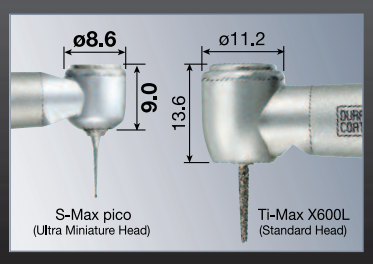
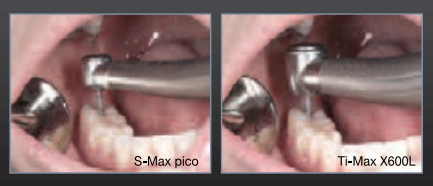
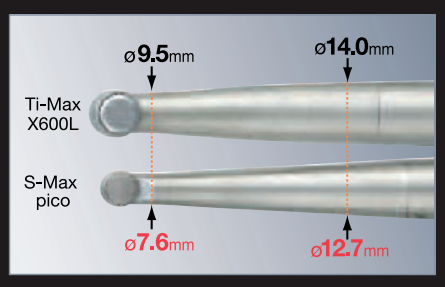


The smallest head in dentistry allows for the biggest treatment area



The slimmest neck in the world



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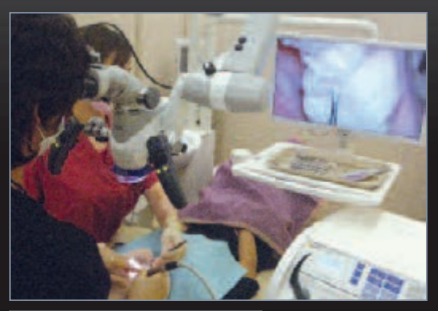

In combination with mirror technique

Are you technologically and ergonomically balanced?

Ergonomic and/or lightweight handpieces may help to reduce the risk of certain musculosk- eletal disorders (MSDs) such as carpal tunnel syndrome (Dong 2006). Advances in technology have provided improvements in ergonomics; thereby, helping to extend the longevity and careers of dental professionals. Improved technology along with normal and neutral positioning of the body, spine and hands will work together- er for positive health.

Over the years, poor posture can affect the musculoskeletal system, which can lead to other complicating health factors. Although, poor posture habits have been created throughout life, it is not too late to learn ergonom- ic principles that can contribute to a long-lasting, pain-free way to practice with less fatigue. Learn- ing and practicing good posture while working should be one of the primary goals for increasing and continuing work efforts.

Another effort on the behalf of the clinician is to engage and embrace new technology and allow that technology to work for you. Many clinicians are intimi- dated by technology and hesitate to make changes, although these changes are for the best.

Repetitive stress injuries (RSI) are defined as cumulative trauma disorders resulting from prolonged repetitive, forceful or awkward movements. These movements result in damage to the muscles, tendons and nerves (Nainzadeh 1999).

Because clinicians are at risk for developing wrist injuries, ergonomic considerations are very important. The correct grasp on instruments, power scalers or dental equipment will help prevent RSI. The use of powered scaling devices is one of the prevailing recommendations for reducing these injuries. Ergo- nomically designed ultrasonic equipment includes scaling units with rotating cables and inserts with balanced handpieces. Power scalers must have a light modified pen grasp.

The advantages of the light grasp are tactile sensitivity, patient comfort and reduced fatigue. In addition, the clinician has the advantage of rolling the handpiece between the fingers to have continuous access to the tooth surface, line angles and interproximal and subgingival areas. In other words, the equipment is doing the work; the clini- cian is guiding it.

Another area of concern is the management of the cords coming off handpieces, equipment and units. Equipment that must have a power cord revisits the fact that improper management and poor design of the cords can increase drag on hand, wrist and arm. This in turn increases the risk of repet- itive injuries, as your fingers must continually counter the force of the cord drag.

The new Midwest® RDH Freedom® handpiece is cordless, bal- anced, lightweight and easy to maneuver. Because of the diam- eter of the handpiece and lack of a cord, it takes less of a pinch grip and no drag to set up ergonomic advantages. This allows the hygienist to take any position around the patient's head to main- tain proper ergonomic angles in the arm and wrist. Combine these features with the cordless foot pedal and it predicts less fatigue and better ergonomics.

In a survey with hygienists, 100 percent of the hygienists approved of the weight of the cordless hand- piece with the attached dispos- able prophy angle. In addition,

90.9 percent found that the Midwest RDH Freedom handpiece was easier to maneuver than a corded device. 93.9 percent of hygienists rated their fatigue light to none at the end of the day using the Midwest RDH Freedom handpiece versus only 33 percent indicating light to no fatigue when using their current polishing handpiece. A remarkable difference!

Modern technology supports ergonomics, and therefore, aids in promoting the longevity of the cli- nician and comfort for the patient when supported with proper pos- ture and technique. Many times technology is not maximized to the fullest, therefore, limiting the benefits. Take advantage of mod- ern advancements in engineering and design and allow your equip- ment to work for you. DT

The role of biology in the orthodontic practice

(Part 1)

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Young Guk Park & Ze'ev Davidovitch
Korea & USA

Orthodontic tooth movement results from forces applied to teeth that evoke cellular responses in the teeth and their surrounding tissues, including the periodontal ligament (PDL), alveolar bone and gingiva. It is advantageous for the orthodontist to know the details of the biological events that unfold during tooth movement because some of these details may differ from one person to another, owing to variables such as gender, age, psychological status, nutritional habits and drug consumption.

The purpose of this article is to emphasise that orthodontics is a field of endeavour in which mechanics and biology are integrated, and to stress the reality that tooth movement is conducted in individual human beings, each with a unique and intricate physiological system. Biological variations may be the foundation of the differences that are frequently observed in the outcomes of orthodontic treatment between patients with similar malocclusions treated identically.

Principles of orthodontic biomechanics are usually taught with the help of a typodont, consisting of artificial teeth embedded in wax. This set-up ignores entirely the biological aspect of tooth movement. In the clinical setting, living patients are encountered, and mechanical forces mobilise their teeth. These movements result from the development of strains in dental and para-dental tissues, followed by modelling and remodelling of these tissues.

In some patients, systemic conditions may exist, causing complications such as root resorption, dehiscences and fenestrations of the alveolar bone. Hence, clinical orthodontics must be viewed as a specialty staunchly entrenched in biology, all the way to the molecular level. As a clinical profession, it must be based on a commanding knowledge of mechanics, biology, physiology, and pathology. The goal of this article is to enhance the biological awareness of the orthodontic practitioner in order to minimise or avoid tissue damage during orthodontic treatment. It will demonstrate that this objective may be achieved by closely focusing on the nature of root movements, and avoiding the dogmatic following of "prescription" methods that promise "automatic" correction of all malocclusions.

Tissue remodelling and orthodontic tooth movement

The actual rate of tooth movement may depend on the rate of bone turnover. The latter was modified pharmacologically in rats undergoing maxillary molar mesial movement, by inducing either hypothyroidism or hyperthyroidism (Verna et al., 2000). In rats with high bone turnover, the rate of tooth movement was increased, while it was reduced in animals with a low turnover. Although all teeth had been moved in the same manner (controlled tipping), the location of the centre of rotation differed, depending on the metabolic state of the bone. Examination of histological sections from the jaws of these rats (Verna et al., 2003) showed that root resorption had occurred in both groups, as well as in the control group, but that it was more pronounced in the low bone turnover group. However, bone metabolism normally demonstrates measurable diurnal fluctuations that may affect the rate of tooth movement. Rats that were exposed to light for 24 or 12 hours per day for 21 days, and were subjected to orthodontic force only during the light period, presented doubling of the rate of tooth movement and bone remodelling, as compared with animals that received the force during the 12 hours of daily darkness (Miyoshi et al., 2001).

The realisation that tissue remodelling in orthodontics is mediated by a variety of cells, including fibroblasts, root and bone surface lining cells; endothelial, epithelial, and nerve cells; as well as different leukocytes, prompted clinical investigators to apply physical and chemical agents, concomitant with orthodontic forces in order to augment the effect of the mechanical forces. In this vein, Tweedle (1965) used local application of heat to paradental tissues surrounding orthodontically treated teeth in dogs, Davidovitch et al. (1980) used minute electric currents, and Blechman (1998) advocated the use of static magnetic fields. Davidovitch et al. placed the electrodes much closer to the cat's canine, resulting in a significant enhancement of movement. Blechman hypothesised that magnets generate mechanical forces, as well as magnetic fields, and that this combination acts synergistically, causing the teeth to move faster. However, an experiment in rats (Tengku et al., 2000) revealed that magnets do not speed up the mesial movement of maxillary molars, and actually increase root resorption in the early phases of treatment.

Utilisation of chemical agents in attempts to increase the pace of tissue remodelling and tooth movement has been tested in various laboratories and clinics. Yamasaki et al. (1984) injected prostaglandin (PG) E1 into the gingiva of moving teeth in human subjects, resulting in rapid movement. Systemic application of misoprostol, a PGE1 analogue, to rats undergoing tooth movement for two weeks, increased the pace of movement significantly without enhancing root resorption (Sekhavat et al., 2002). Similar results were reported following intraperitoneal injections of PGE2 in rats (Seifi et al., 2003). Chumbley and Tuncay (1986) administered indomethacin systemically, a PG synthetase inhibitor. Collins and Sinclair (1988) used local applications of vitamin D, while

Engstrom, Granstrom and Thilander (1988) moved teeth in hypocalcaemic, vitamin-D-deficient, lactating rats. The bone matrix component osteocalcin was injected in rats into the palatal bifurcation of a tipping molar, causing rapid tooth movement owing to the attraction of numerous osteoclasts to this site (Hashimoto et al., 2001).

The reports cited above suggest that the extent of tissue remodelling and the rate of tooth movement can be significantly influenced by numerous factors capable of interacting with paradental cells. However, if our goal is to complete orthodontic treatment successfully and in the shortest possible amount of time, then we should avoid moving roots into areas from which they will have to be retrieved later.

When mechanical loads are applied to intact tissues in vivo or in vitro, the tissues usually become distorted (strained). In the case of the skeleton, loads like gravity prompt cells to arrange the architecture of the bony structural features in a way that will resist redundant loads. This phenomenon is known as Wolff's Law, defined by Julius Wolff in 1892. However, when bone cells are subjected to non-redundant loads, such as orthodontic forces, the cells are activated, and remodelling of the alveolar process ensues, which facilitates tooth movement. In vivo applications of compressive loads to ulnae in turkeys and roosters by Lanyon and Rubin (1984) revealed that extensive osteogenesis can be evoked by short-term dynamic (intermittent) forces. In those experiments, the optimal load magnitude was 2,000 to 4,000 microstrain, and its daily duration was ten to 20 minutes. These findings suggest that orthodontic forces will be most effective when applied for brief periods, rather than continuously. This assumption was found to be correct in an experiment in rats by Gibson, King, and Keeling (1992). In that experiment, maxillary molars were subjected to mesially moving forces for one hour, one day, or 14 days. Teeth exposed to only one hour of force application continued to move mesially for 14 days, and achieved 75% of the movement reached by the teeth that had been subjected to orthodontic forces continuously for 14 days.

The age factor

The effect of age on the tissue response to orthodontic force has occupied the minds of orthodontists since Hunter, in the 18th century, and probably earlier. Hunter observed that orthodontic treatment takes longer in adults than in children. Studying histological sections of human teeth and their surrounding tissues, Reitan concluded that the PDL is less cellular in adults than in children. Therefore, he recommended, when treating adults, to subject their teeth to light forces initially, in order to stimulate cellular proliferation, then to increase the force magnitude, in order to stimulate these cells to remodel the para-dental tissues. This observation implies that, in essence, the nature of the biological response to orthodontic forces is similar in young and adult subjects. This hypothesis was confirmed by Shimpo et al. (2003). These investigators moved molars bilingually in young (13-week-old) and old (60-week-old) rats, then studied their compensatory alveolar bone apposition under the lingual periosteum. They reported that in both age groups there had been vigorous compensatory alveolar bone growth. Thus, alveolar bone is successfully maintained, even in aged rats. Age can also refer to the duration of healing of a post-operative regenerate following distraction osteogenesis (Nakamoto et al., 2002). In an experiment on 15-month-old beagles, mandibular premolars were moved into a two-week or a 12-week regeneration period. The former consisted of immature, fibrous, and poorly mineralised bone, while the latter was composed of mature, well-organised and mineralised bone. Tooth movement was significantly faster in the "young", immature regenerate, but this movement was accompanied by extensive root resorption that extended from the cemento-enamel junction to the root apex.

The effects of pre-existing medical conditions and the development of complications

It is estimated that 10 to 15% of all children under the age of 16 are affected by chronic, long-term medical problems. These problems may affect the outcome of orthodontic treatment (Burden et al., 2001). Common med-

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ical problems in this age group include infective endocarditis, bleeding disorders, leukaemia, diabetes, cystic fibrosis, juvenile rheumatoid arthritis and renal failure. An even higher percentage of adult patients may be afflicted by a variety of medical problems that involve one or more of the tissue systems. These conditions, and the medications used to treat them may have profound effects on the response of dental and para-dental cells to mechanical loading.

Endocarditis is a life-threatening disease, requiring primary prevention in the form of administration of antimicrobial agents prior to certain orthodontic procedures. The orthodontist must weigh the risk of endocarditis against the risk of an adverse reaction to the prescribed antibiotic therapy. Fortunately, most orthodontic procedures do not cause bacteraemia. Lucas et al. (2002) obtained blood samples from children 30 seconds after taking dental impressions, separator placement, band placement and insertion of an adjusted arch wire. Significant bacteraemia was found only after separator placement.

Orthodontic braces, fixed and removable, can accumulate bacterial plaque that may be harmful to oral soft and hard tissues. This problem has been addressed by adding antimicrobial agents to bracket bonding materials, elastic bands and crown coating varnishes. The addition of benzalkonium chloride to a composite resin added antimicrobial properties to the compound without altering its mechanical properties (Othman et al., 2002). Likewise, coating teeth in orthodontic patients with a sustained-release chlorhexidine varnish decreases Streptococcus mutans levels in the patients' saliva (Beyth et al., 2003).

Children treated for childhood cancers with both radiation and chemotherapy often exhibit disturbances in dental development, such as tooth agenesis, teeth with short roots or with no roots altogether. A retrospective analysis of treatment outcome in ten orthodontic patients with such a background revealed that five had been treated with lighter forces than usual, one displayed root resorption, and four achieved unsatisfactory results (Dahllof et al., 2001).

The development of inflammation in dental and para-dental tissues during the course of orthodontic treatment implies that circulating plasma and leukocytes migrate out of capillaries, and interact with native cells. The blood plasma may contain endogenous hormones produced by endocrine glands, as well as a variety of molecules derived from consumed drugs and nutrients. Some of these molecules may interact with para-dental target cells, augmenting or inhibiting the effects of mechanical forces on these cells. One of the main complications of such interactions is the development of root resorption.

Diabetes mellitus afflicts 3 to 4% of the population, and is characterised by hyperglycaemia caused by the body's deficient management of insulin. There are two main types of diabetes: type 1 and type 2. In type 1, there is a total deficiency in insulin secretion, while in type 2 there is a combination of resistance to insulin action and insufficient compensatory insulin secretion. Diagnosis and monitoring of diabetes is based on blood glucose concentration or glycosylated haemoglobin concentration. Oral manifestations of the disease include xerostomia, chronic gingivitis and periodontitis, excessive loss of alveolar bone and PDL, poor healing of wounds, and soft tissue lesions, both candidal and non-candidal (Bensch et al., 2003). Orthodontic treatment should be combined with frequent dental care sessions and maintenance of excellent oral hygiene. The magnitude of applied forces should be smaller than usual, reflecting the loss of dental support tissues.

Periodontitis, acute or chronic, may be present before the onset of orthodontic treatment, or occur during the course of treatment owing to the accumulation of a bacterial plaque around the braces. Peripheral blood monocytes obtained from individuals with chronic periodontitis synthesised large amounts of pro-inflammatory cytokines when incubated in vitro with bacterial lipopolysaccharides. If such primed monocytes find their way into strained para-dental tissues, their increased production levels of cytokines may increase the risk of root resorption. An indicator of such an increased risk may be the concentration of cytokines in the gingival crevicular fluid. Previous studies reported on increased levels of cytokines, such as tumour necrosis factor- and interleukin-6 in the gingival crevicular fluid of orthodontically treated teeth in humans (Kim and Park, 2000). The origin of these cytokines is most likely PDL cells.

Allergies and asthma are conditions involving periodic productions of large amounts of pro-inflammatory cytokines in the airway mucosa and the skin. Primed leukocytes derived from these tissues may travel through the circulation into the extravascular space of the tissues surrounding orthodontically treated teeth. Consequently, patients with a history of allergies and/or asthma appear to be at a high risk of developing excessive root resorption during the course of orthodontic treatment (Davidovitch et al., 1999). Hence, it is postulated that any inflammatory condition, such as gastro-enteritis, arthritis and thyroiditis, may increase the risk of orthodontic root resorption.

Allergy manifestations in orthodontics are infrequent, although the frequency of allergic diseases in the industrialised world is rising. The WHO reports that 15% of the population has had or will have an allergic disease.

Allergic reactions to orthodontic materials can develop during treatment, manifesting as urticaria, angioedema, stomatitis and cheilitis (Beaudovin et al., 2003). Metals in orthodontic appliances that can induce an allergic reaction are nickel, chromium, cobalt and titanium. Other allergy-inducing materials include latex, resins, adhesives and methyl methacrylates. When a reaction that appears to be allergy-related is detected in an orthodontic patient, there should be referral to an allergist for advice. Close collaboration between the orthodontist and the allergist is essential for each future stage of the orthodontic treatment in order to avoid further complications.

A method to detect patients sensitive to orthodontic alloys was developed in the form of an in vitro cell proliferation assay (Marigo et al., 2003). The best parameters for inducing the strongest cell proliferation response were 10 µg/ml nickel sulphate, 10 % autologous serum, and 200,000 cells. With this method, it was possible to distinguish between nickel-sensitive and non-nickel-sensitive patients. Moreover, it was found that exposure to nickel alloys for periods longer than two years may lead to the development of oral tolerance mechanisms that modulate nickel sensitivity.

Consumption of low or moderate amounts of alcohol may have beneficial effects on the cardiovascular system, but chronic ingestion of large amounts of alcohol on a daily basis may have devastating effects on a number of tissue systems, including the skeletal system. Alcoholism may lead to severe complications, such as liver cirrhosis, neuropathies, osteoporosis, and spontaneous bone fractures. Circulating ethanol inhibits the hydroxylation of vitamin D3 in the liver, thus impeding calcium homeostasis. In such situations, the synthesis of parathyroid hormone is increased, tipping the balance of cellular functions towards enhanced resorption of mineralised tissues, including dental roots, in order to maintain normal levels of calcium in the blood (10 mg). Therefore, chronic alcoholics receiving orthodontic treatment are at a high risk of developing severe root resorption during the course of orthodontic treatment.

Demyelinating diseases such as multiple sclerosis are associated with an abnormally high incidence of trigeminal neuralgia. In multiple sclerosis, afferent nerve fibres lose their myelin sheaths, leading to short circuits between axons. Such shorts in the trigeminal nerve may precipitate trigeminal neuralgia. Orthodontic treatment evokes an inflammatory reaction in para-dental tissues, including painful sensations that travel in an antidromic fashion from strained para-dental sensory nerve endings. If areas of demyelination are present along the way to the Gasserian ganglion, trigeminal neuralgia may ensue.

Psychological stress is a common component of everyday life. It may be found to exist in patients prior to the onset of orthodontic treatment, or it may develop during the course of treatment owing to discomfort, resentment or other reasons unrelated to orthodontics. Psychological stress affects the hypothalamic-pituitary-adrenal (HPA) axis, and the immune system. Since osteoclasts and odontoclasts are derived from the immune system, modification of their function by psychological stress may affect the process of root resorption. A recent survey revealed that orthodontic patients with psychological stress were at a high risk of developing excessive root resorption during the course of orthodontic treatment (Davidovitch et al., 1999). Furthermore, patients who are non-compliant, poor co-operators and those who frequently break appointments and/or appliances do it most likely because of psychological stress. Often, these non-compliant individuals express their objection to orthodontic care that had been imposed on them by their parents through their behaviour. In these individuals, the rate of orthodontic root resorption was found to be significantly higher than in compliant patients.

Amongst the reasons for partial and total loss of scalp hair is psychological stress, probably through effects on the HPA axis. Davidovitch et al. (1999) reported a case of an adolescent orthodontic patient who developed alopecia totalis during orthodontic treatment. A review of the case revealed a normal medical background with the presence of a persistent psychological stress owing to exposure to orthodontic mechanotherapy. Consequently, the patient's paediatrician and the endocrinologist concluded that his alopecia had been most likely caused by psychological stress evoked by the orthodontic treatment. DT

Part 2 of this article will be published in DT ME 10 (2011). A complete list of references is available from the publisher.

Planmeca and Materialise Dental announce co-operation

The Finnish dental equipment manufacturer Planmeca Oy and Belgium-based Materialise Dental started a joint effort that benefits users of Planmeca ProMax 3D imaging devices. Planmeca ProMax 3D users now can directly order Materialise Dental SurgiGuide® drill guides based on the implant planning done in the Planmeca Romexis software.

The Planmeca ProMax 3D customers can order Materialise Dental SurgiGuide® drill guides directly from Planmeca Romexis software. This opens new perspectives for Planmeca's cone beam users, who can transfer their implant planning from the Planmeca Romexis software to the patient's mouth, using the trusted technology of SurgiGuide® drill guides.

A variety of implants can be planned in Planmeca Romexis with all available tools. This information is sent, together with the DICOM images, to Materialise Dental as a SurgiGuide® order. Materialise Dental will then import the data in their SimPlant® software, and contact the customer to verify and discuss the planning in SimPlant®.

This ensures perfect transfer of the data and full compatibility. SurgiGuide® options are discussed to find the optimal solution for transferring the implant planning to the mouth of the patient, based on the specifics of each case, the surgeon's preferences and implant systems used. This way, all technicalities are covered by the service. After production, the customer receives the SurgiGuide®, ready for use in surgery.

"This new cooperation will help the users of our Planmeca ProMax 3D cone beam X-ray devices to further benefit from their system. The implant planning can be done conveniently in Planmeca Romexis software, the same software used for image capturing, and whenever there is a need for guided surgery, Materialise Dental's prominent SurgiGuide® drill guides can be ordered and the process finalised with Materialise Dental's professionals", states Ms Helianna Puhlin-Nurminen, Vice President of Digital Imaging and Applications Division at Planmeca Oy.

"We are excited about this co-operation with Planmeca as a leading cone beam manufacturer," says Mr Bert Van Roie, International Product Manager SimPlant® and SurgiGuide®.

"Since years our SurgiGuide® drill guides ensure a fully predictable transfer of the digital implant planning from SimPlant® to the mouth of the patient. Now we can offer the same benefit to all Planmeca users, directly from within Planmeca Romexis."

Managing bone with Acteon

The Thailand subsidiary of French dental manufacturer Acteon has announced to hold a seminar and workshop on the issue of bone management next January in Bangkok, Thailand. The seminar will be joined by Drs Fred Bergmann and Surakit Visuttiwattanakorn as well as Profs. Fumihiko Watanabe and Lars Sennerby. DT

AD

Philips divests Discus unit to SybronEndo

SybronEndo has announced that it has acquired the endodontic business unit from Discus Dental, a U.S. dental company currently held by Philips. The takeover will take effect immediately and includes Discus' entire product range of irrigation systems and other products under the Smart Endo brand, as well as patents and licenses, the company said in a press release.

On their websites, both companies advise customers to contact their SybronEndo representatives for all future Discus Dentalproduct orders. Further information were not disclosed.

SybronEndo is a business division of Sybron Dental Specialties, a California-based dental conglomerate comprising business units involved in orthodontics, endodontics, infection prevention and dental implants. As part of the Kerr Corporation, the company has operated in the dental market for almost 100 years.

Discus Dental was acquired by Dutch consumables manufacturer Philips almost a year ago

Zimmer reveals NextGen implant with osseoincorporation functionality

ATHENS, Greece: A Tapered Screw-Vent implant featuring osseoincorporation was revealed by Zimmer Dental this morning at the Annual Congress of the European Association of Osseointegration (EAO) in Athens in Greece. The new implant has an osteoconductive midsection made of Trabecular Metal, a highly biocompatible material with a structure similar to cancellous bone, and is compatible with the company's Tapered Screw-Vent Surgical Kit and range of prosthetics.

Trabecular Metal has been already used for more than a decade in many of Zimmer's orthopaedic devices. Made from tantalum, a rare and highly corrosion resistant metal already used for dental implants since the 1950s, it offers high porosity that allows bone around implant sites to grow not only onto the material but also into it—a process known as osseoincoporation.

Zimmer acquired the technology from an acquisition of the Implex Corporation in 2003

New light on oral leucoplakia

Chemical luminescence can aid in the visualisation of oral leucoplakia, new research has found. Following oral examinations, researchers at King's College London Dental Institute evaluated the accuracy of chemiluminescence in detecting potentially malignant oral disorders using a commercially available detection kit. DT

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